

2/8/25

Week -1

MCQ:

1. import java.util.\*;

Class relational {

    public static void main(String[] args)

    { int x=8, y=4;

        boolean result=(x==y);

        System.out.println(result);

}

} // End of class relational

Ans: true

2. import java.util.\*;

Class Ternary {

    public static void main(String[] args)

        int a=5, b=10;

        int result=(a>b)?a:b;

        System.out.println(result);

}

} // End of class Ternary

3. class Testclass {

    public static void main(String[] args)

    { int a=5;

        int b=10;

        int sum=a+b;

        int bitwiseAnd=a&b;

        int bitwiseOR=a|b;

        System.out.println(sum);

        System.out.println(bitwiseAnd);

        System.out.println(bitwiseOR);

}

} // End of class Testclass

Ans: 15

0

15

4. Which of the following data types is used to store floating point numbers with greater precision?

Ans: double

5. import java.util.\*;

Class Complex {

    public static void main(String[] args)

    { int a=5, b=2, c=3, d=4;

        int result=a+b\*c/d-b;

        System.out.println(result);

}

} // End of class Complex

Ans: 4

6. Class Division {

    public static void main(String[] args)

        double num1=10.5;

        double num2=3;

        int result=(int)(num1/num2);

        System.out.println(result);

} // End of class Division

Ans: 3

7. class Testclass {

    public static void main(String[] args)

        int a=10;

        int b=3;

        System.out.println(a/b);

} // End of class Testclass

Ans: 3

8. class Testclass {

    public static void main(String[] args)

        int x=5;

        int y=10;

        int sum=x+y;

        int bitwise=x|x;

        System.out.println(sum);

        System.out.println(bitwise);

} // End of class Testclass

Ans: 15

15

9. class Arithmetic {

    public static void main(String[] args)

        char ch='A';

        System.out.println(ch);

} // End of class Arithmetic

Ans: A

10. class TestClass {

    public static void main(String[] args)

        int count=8;

        count=count/1;

        System.out.println(count);

} // End of class TestClass

Ans: 9

11. Which of the following data types

is used to store single characters?

Ans: char

12. class Demo {

    public static void main(String[] args)

        String text="Hello,world!";

        System.out.println(text);

} // End of class Demo

Ans: Hello,world!



13. Which of the following is not a primitive data type? Ans: String

```
import java.util.*;  
class Operator{  
    public static void main(String[] args)  
    {  
        int a=5, b=3, c=2;  
        int result = a+b+c;  
        System.out.println(result);  
    }  
}
```

Ans: 11

14. Class Datatype{  
 public static void main(String[] args)  
 {  
 int a=10;  
 double b=5;  
 System.out.println(a/b);  
 }  
}

Ans: 2.0

1) Program to find temperature difference

```
import java.util.Scanner;  
class Main{  
    public static void main(String args[]){  
        Scanner sc = new Scanner(System.in);  
        int N = sc.nextInt();  
        int M = sc.nextInt();  
        int x, y;  
        if(N<100)  
            x = 100-N;  
        else  
            x = N-100;  
        if(M<100)  
            y = 100-M;  
        else  
            y = M-100;  
        if(x < y)  
            System.out.println("The integer closer to 100 is "+N+" with a difference of "+x);  
        else  
            System.out.println("The integer closer to 100 is "+M+" with a difference of "+y);  
    }  
}
```

Input: 90  
Output: 10  
The integer closer to 100 is 90 with a difference of 10.

2) Write program to find integers is divisible or not by 3;

```
import java.io.*;  
import java.util.Scanner;  
class Main{  
    public static void main (String args[]){  
        Scanner sc = new Scanner (System.in);  
        int a = sc.nextInt();  
        int b = sc.nextInt();  
        if((a>0) & (b>0)) || ((a<0) & (b<0))  
            System.out.println("one of the integers is positive");  
        else  
            System.out.println("Neither of integers meets the conditions");  
    }  
}
```



Scanned with OKEN Scanner

```

import java.io.*;
import java.util.Scanner;
class Main {
    public static void main (String args[])
    {
        Scanner sc = new Scanner (System.in);
        int a = sc.nextInt();
        System.out.println ("Original integer: " + a);
        double b = (int)a;
        System.out.println ("Converted double: " + b);
    }
}

```

Input: 20  
Output:  
 Original integer: 20  
 Converted double: 20

- 4) Write program to find sum is a multiple of product.

```

import java.io.*;
import java.util.Scanner;
class Main {
    public static void main (String args[])
    {
        Scanner sc = new Scanner (System.in);
        int a = sc.nextInt();
        int b = sc.nextInt();
        int sum = a+b;
        int product = a*b;
        if (sum % product == 0)
            System.out.println ("sum is multiple of product");
        else
            System.out.println ("sum is not multiple of product");
    }
}

```

Input: 12  
Output:  
 sum is not multiple of product

- 5) To calculate circumference & radius:

```

import java.io.*;
import java.util.Scanner;
class Main {
    public static void main (String args[])
    {
        Scanner sc = new Scanner (System.in);
        double r = sc.nextDouble();
        double C = 2 * 3.14159 * r;
        double A = 3.14159 * r * r;
        System.out.printf ("circumference: %.2f meters\n", C);
        System.out.printf ("Area: %.2f square meters\n", A);
    }
}

```

Input: 3.0  
Output:

Circumference: 18.85 meters  
 Area: 28.27 square meters

```

6) import java.io.*;
import java.util.Scanner;
class main{
    public static void main (String args[])
    {
        Scanner sc = new Scanner (System.in);
        int x = sc.nextInt();
        int N = sc.nextInt();
        int result = (x & (1<<N)-1);
        System.out.println ("Result : " + result);
    }
}

```

Input: 85      Output: 1  
2

7) write program to meet Conditions :

```

import java.io.*;
import java.util.Scanner;
class main{
    public static void main (String args[])
    {
        Scanner sc = new Scanner (System.in);
        int a = sc.nextInt();
        int b = sc.nextInt();
        if (((a<=0) && (a%2!=0)) || ((b<=0) && (b%2!=0)))
            System.out.println ("true");
        else
            System.out.println ("false");
    }
}

```

Input: -45      Output: true

8) import java.io.\*;
import java.util.Scanner;
class main{
 public static void main (String args[])
 {
 Scanner sc = new Scanner (System.in);
 int a = sc.nextInt();
 int b = sc.nextInt();
 int c = sc.nextInt();
 double avg = (a+b+c)/3.0;
 System.out.printf ("%f\n", avg);
 if ((avg>a) && (avg>b) && (avg>c))
 System.out.println ("Average is greater than " + a + " and " + b);
 else if ((avg>a) && (avg>c) && (avg<b))
 System.out.println ("Average is greater than both " + a + " and " + c);
 else if ((avg>b) && (avg>c) && (avg<a))
 System.out.println ("Average is greater than both " + b + " and " + c);
 else
 System.out.println ("Average is not greater than two expenses");
 }
}



9) use relational operators to solve the Q.

```

import java.util.Scanner;
class Main {
    public static void main (String args[]) {
        Scanner sc = new Scanner (System.in);
        int s1 = sc.nextInt();
        int s2 = sc.nextInt();
        int s3 = sc.nextInt();
        if (s2 + 2 == s1 + s3) {
            System.out.println ("true");
            System.out.println ("The second integer is halfway.");
        } else {
            System.out.println ("false");
            System.out.println ("The second integer is not halfway.");
        }
    }
}

```

Input: 10 20 30  
Output: The second integer is halfway.

10) import java.util.Scanner;

```

class Main {
    public static void main (String args[]) {
        Scanner sc = new Scanner (System.in);
        int x = sc.nextInt();
        int y = sc.nextInt();
        int z = sc.nextInt();
        int d1 = sc.nextInt();
        int d2 = sc.nextInt();
        WorkDistribution wd = new WorkDistribution();
        wd.work (x, y, z, d1, d2);
    }
}

class WorkDistribution {
    public static void calculateWork (int x, int y, int z, int d1, int d2) {
        double A = 1.0 / x;
        double B = 1.0 / y;
        double C = 1.0 / z;
        double w1 = d1 * (A + B + C);
        double w2 = d2 * (A + B);
        double w3 = 1 - (w1 + w2);
        System.out.println ("Workdone in 1st days (A+B+C): %.2f\n", w1);
        System.out.println ("Workdone in 2nd days (A+B): %.2f\n", w2);
        System.out.println ("Remaining work: %.2f\n", w3);
    }
}

```



```

1) import java.util.Scanner;
class Main {
    public static void main (String args[]){
        Scanner sc = new Scanner (System.in);
        int a = sc.nextInt();
        int b = sc.nextInt();
        if ((a%2==0) && (b%2==0) || (a%2!=0) && (b%2!=0)) {
            System.out.println ("Both integers are odd or even");
        } else {
            System.out.println ("Integers have different parities");
        }
    }
}

```

Input: 2  
-4  
Output: Both integers are odd or even

```

2) import java.util.Scanner;
class Main {
    public static void main (String args[]){
        Scanner sc = new Scanner (System.in);
        int a = sc.nextInt();
        int b = sc.nextInt();
        int closest;
        if (Math.abs(a) < Math.abs(b)) {
            closest = a;
        } else if (Math.abs(b) < Math.abs(a)) {
            closest = b;
        } else {
            closest = 0;
        }
        System.out.println ("The integer closest to zero: " + closest);
    }
}

```

Input: 5  
8  
Output: The integer closest to zero: 5

```

3) import java.util.Scanner;
class Main {
    public static void main (String args[]){
        Scanner sc = new Scanner (System.in);
        int p = sc.nextInt();
        int w = sc.nextInt();
        double x = w/3.0;
        System.out.printf ("one third: %.2f\n", x);
        String result = (p < x) ? "Package is less than one third" : "Package is not less than one third";
        System.out.println (result);
    }
}

```



4) `import java.util.Scanner;`  
class main

Input: Output:

25

```
public static void main(String args[])
{
    Scanner sc = new Scanner(System.in);
    int a = sc.nextInt();
    int result = a & 1;
    System.out.println(result);
}
```

D) `import java.util.Scanner;`  
class main

Input: Output:

0 Is the integer odd? false

```
public static void main(String args[])
{
    Scanner sc = new Scanner(System.in);
    int a = sc.nextInt();
    if (a % 2 == 0)
        System.out.println("Is the integer odd? true");
    else
        System.out.println("Is the integer odd? false");
}
```

2) `import java.util.Scanner;`

Input: Output:

16 Is the integer a perfect square? true

```
class main
{
    public static void main(String args[])
    {
        Scanner sc = new Scanner(System.in);
        int a = sc.nextInt();
        boolean result;
        if (a < 0)
            result = false;
        else
        {
            int sqrt = (int) Math.sqrt(a);
            result = (sqrt * sqrt == a);
        }
        System.out.println("Is the integer a perfect square?" + result);
    }
}
```



10/8/25 Week -2

Skill builder:

1) import java.util.Scanner;

Class main

{

    public static void main (String args[])

{

        Scanner sc = new Scanner (System.in);

        int arr[] = new int [5];

        int sum=0;

        for (int i=0; i<5; i++)

            arr[i] = sc.nextInt();

            sum = sum+arr[i];

}

        int avg = sum/5;

        if (avg >= 50)

            System.out.println ("Average score: " + avg);

            System.out.println ("The student has passed");

        else

            System.out.println ("Average score: " + avg);

            System.out.println ("The student has failed");

}

Input:

50 60 70 80 90

Output:

Average score: 70

The student has passed

2) import java.util.Scanner;

Class main

{

    public static void main (String args[])

{

        Scanner sc = new Scanner (System.in);

        int N = sc.nextInt();

        if ((N%5==0) && (N%7==0)) {

            System.out.println ("N is a multiple of 5");

            else if (N%7==0)

                System.out.println ("N is a multiple of 7");

            else

                System.out.println ("N is neither multiple of 5 nor 7");

}

Input:

10

Output:

10 is a multiple of 5

3) import java.util.Scanner;

Class main

{

    public static void main (String args[])

{

        Scanner sc = new Scanner (System.in);

        double h = sc.nextDouble();

        double w = sc.nextDouble();

        double bmi = w/(h\*h);

        System.out.printf ("BMI: %.2f\n", bmi);

        if (bmi < 18.5)

            System.out.println ("Classification: underweight");

Input: 1.2

45.2

Output:

BMI: 31.39

Classification: obese



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```

else if (bmi >= 18.6 & bmi < 24.9)
    system.out.println("Classification: Normal weight");
else if (bmi >= 25.0 & bmi < 29.9)
    system.out.println("Classification: overweight");
else
    system.out.println("Classification: obese");
}

```

4) import java.util.\*;

```

class main
{
    public static void main (String args[])
    {
        Scanner sc = new Scanner (System.in);
        int a = N;
        int sum = 0;
        int digitCount = 0;
        do {
            int digit = a % 10;
            sum += digit;
            digitCount++;
            a = a / 10;
        } while (a > 0);
        if (digitCount == sum)
            System.out.println("The digits matches the sum.");
        else
            System.out.println("The digits does not matches the sum.");
    }
}

```

Input : 20

Output:

The digits matches the sum.

5) import java.util.\*;

```

class main
{
    public static void main (String args[])
    {
        Scanner sc = new Scanner (System.in);
        int n = sc.nextInt();
        for (int i = 1; i <= n; i++)
            for (int j = 1; j <= i; j++)
                System.out.print("*");
        System.out.print("\n");
        for (int i = n - 1; i >= 0; i--)
            for (int j = 1; j <= i; j++)
                System.out.print("*");
        System.out.print("\n");
    }
}

```

Input : 5

Output:

\* \* \* \* \*

\* \* \* \* \*

\* \* \* \* \*

\* \* \* \* \*

\* \* \* \* \*

\* \* \* \* \*

\* \* \* \* \*

6) `import java.util.*;`  
`class main`  
`{`  
 `public static void main (String args[])` Output:  
 `{`  
 `Scanner sc = new Scanner (System.in);`  
 `int n = sc.nextInt();`  
 `for (int i=1; i<=n; i++) {`  
 `for (int s=1; s<=n-i; s++) {`  
 `System.out.print (" ");`  
 `}`  
 `for (int j=1; j<=i-1; j++) {`  
 `System.out.print(j);`  
 `}`  
 `System.out.println();`  
 `}`  
 `}`

---

7) `import java.util.*;`  
`class main`  
`{`  
 `public static void main (String args[])` Input:  
 `{`  
 `Scanner sc = new Scanner (System.in);`  
 `int n = sc.nextInt();`  
 `int count = 0;`  
 `int i, j, k;`  
 `for (i=1; i<=9; i++) {`  
 `for (j=0; j<=9; j++) {`  
 `if (j==i) {`  
 `Continue;`  
 `for (k=0; k<=9; k++) {`  
 `if ((k==i) || (k==j))`  
 `Continue;`  
 `int num = i * 100 + j * 10 + k;`  
 `if (num % 3 == 0) {`  
 `System.out.println (num);`  
 `count++;`  
 `if (count == n)`  
 `return;`  
 `}`  
 `}`  
 `}`  
 `}`

---

8) `import java.util.*;`  
`class main`  
`{`  
 `public static void main (String args[])` Input:  
 `{`  
 `Scanner sc = new Scanner (System.in);`  
 `int cost = sc.nextInt();`  
 `double d = (double) cost;`  
 `int year = sc.nextInt();`  
 `double current = (double) cost;`  
 `for (int i=1; i<=years; i++) {`  
 `d = d - (d * 0.15);`  
 `}`

```

        System.out.printf("Current value: %d\n", d);
        if(d > 10000)
            System.out.println("Category: High");
        else if(d >= 500 & d <= 10000)
            System.out.println("Category: Medium");
        else
            System.out.println("Category: Low");
    }
}

```

08/25

## Week-3

1) import java.util.\*;

Class Main

```

public static void main (String args[]){
    Scanner sc = new Scanner (System.in);
    int n = sc.nextInt();
    int [] arr = new int[n];
    for(int i=0; i<n; i++){
        arr[i] = sc.nextInt();
    }
    int sum = 0;
    Arrays.sort(arr);
    int third = arr[n-3];
    int second = arr[1];
    for(int i=0; i<n; i++){
        sum = third + second;
    }
    System.out.println(sum);
}

```

Input:  
10 28 47

Output:

38

import java.util.\*;

class Main

```

public static void main (String args[]){
    Scanner sc = new Scanner (System.in);
    int n = sc.nextInt();
    int arr[][] = new int[n][n];
    for(int i=0; i<n; i++){
        for(int j=0; j<n; j++){
            arr[i][j] = sc.nextInt();
        }
    }
    int main = 0;
    int diagonal = 0;
    for(int i=0; i<n; i++){
        main = arr[i][i];
        diagonal = arr[i][n-i-1];
    }
    System.out.println("sum of main diagonal: " + main);
    System.out.println("sum of secondary diagonal : " + diagonal);
}

```

Input: 3

1 2 3

4 5 6

7 8 9

Output:

sum of main

diagonal: 15

sum of secondary

diagonal: 15



```

3) import java.util.*;
class main
{
    public static void main(String args[])
    {
        Scanner sc = new Scanner (System.in);
        int n = sc.nextInt();
        int arr[] = new int[n];
        for(int i=0; i<n; i++)
        {
            arr[i] = sc.nextInt();
        }
        int sum = 0;
        int sum = arr[0] + arr[n-1];
        System.out.println("sum of last & first elements: " + sum);
    }
}

```

Input:  
10 20 30 40 50 60  
Output:  
sum of last & first elements: 60

```

4) import java.util.*;
class main
{
    public static void main (String args[])
    {
        Scanner sc = new Scanner (System.in);
        int n = sc.nextInt();
        int m = sc.nextInt();
        int a[][] = new int[n][m];
        int b[][] = new int[n][m];
        int sum[][] = new int[n][m];
        for(int i=0; i<n; i++)
        {
            for(int j=0; j<m; j++)
            {
                a[i][j] = sc.nextInt();
            }
        }
        for(int i=0; i<n; i++)
        {
            for(int j=0; j<m; j++)
            {
                b[i][j] = sc.nextInt();
            }
        }
        for(int i=0; i<n; i++)
        {
            for(int j=0; j<m; j++)
            {
                sum[i][j] = a[i][j] + b[i][j];
            }
        }
        for(int i=0; i<n; i++)
        {
            for(int j=0; j<m; j++)
            {
                System.out.print(sum[i][j] + " ");
            }
            System.out.println();
        }
    }
}

```

Input:  
1 3  
25 5 5  
5 49 5  
Output:  
30 49 10



```

3) import java.util.*;
class main {
    public static void main (String args[]){
        scanner sc = new scanner (System.in);
        int n = sc.nextInt(); Input: 5
        int [] arr = new int[n];
        for (int i=0; i<n; i++) {
            arr[i] = sc.nextInt(); 15 34 23 15 34 23
        }
        boolean repeated = false;
        for (int i=0; i<n; i++) {
            for (int j=i+1; j<n; j++) {
                if (arr[i] == arr[j]) { if arr[0] == arr[1]
                    System.out.println(arr[i]); 15
                    repeated = true;
                    break;
                }
            }
            if (repeated)
                break;
        }
        if (!repeated) { if (!repeated)
            System.out.println("No repeated element found in the array");
        }
    }
}

```

Week - 4:

```

1) import java.util.*;
class main {
    public static void main (String args[]){
        scanner sc = new scanner (System.in);
        int T = sc.nextInt();
        sc.nextLine();
        for (int t=0; t<T; t++) {
            String passage = sc.nextLine();
            int commas = 0, periods = 0, questionmarks = 0;
            for (int i=0; i<passage.length(); i++) {
                char ch = passage.charAt(i);
                if (ch == ',') {
                    commas++;
                } else if (ch == '.') {
                    periods++;
                } else if (ch == '?') {
                    questionmarks++;
                }
            }
            System.out.println (commas + " " + periods + " " + questionmarks);
        }
    }
}

```

Input:

1  
Hello, world -  
How are you?

Output:

1 1



Input:

2) import java.util.\*;

```
class main {
    public static void main (String args[])
    {
        Scanner sc = new Scanner (System.in);
        int n = sc.nextInt();
        sc.nextLine();
        String sentence = sc.nextLine();
        String[] words = sentence.split ("\n");
        Arrays.sort (words);
        for (int i=0; i<n; i++)
        {
            System.out.print (words[i]);
            if (i < n - 1)
                System.out.print (" ");
        }
    }
}
```

Output:

AI Blockchain  
Cloud  
cybersecurity

Input:

3) import java.util.\*;

```
class main {
    public static void main (String args[])
    {
        Scanner sc = new Scanner (System.in);
        int T = sc.nextInt();
        sc.nextLine();
        for (int i=0; i<T; i++)
        {
            String s = sc.nextLine();
            if (s.length() == 10 && s.charAt(0) != '0' && s.matches ("^0-9+"))
                System.out.println ("YES");
            else
                System.out.println ("NO");
        }
    }
}
```

Output:

1234567890  
9876543210  
YES

Input:

4) import java.util.\*;

```
class main {
    public static void main (String args[])
    {
        Scanner sc = new Scanner (System.in);
        String sentence = sc.nextLine();
        String[] words = sentence.split ("\\s+");
        boolean found = false;
        for (String word : words)
        {
            if (word.matches ("^a-zA-Z+").&& word.length() >= 2)
                System.out.print (word + " ");
            found = true;
        }
        if (!found)
            System.out.println ("No valid words.");
    }
}
```

Output:

a b c3e  
No valid words



```

5) import java.util.*;
class main {
    public static void main (String args[]){
        Scanner sc = new Scanner (System.in);
        int T = sc.nextInt();
        sc.nextLine();
        for (int i=0; i<T; i++){
            String s = sc.nextLine();
            if (s.length() == 4 && s.matches ("[0-9]+") && s.charAt(0) != s.charAt(1) && s.charAt(0) == s.charAt(2) && s.charAt(2) == s.charAt(3)){
                System.out.print ("YES");
            } else {
                System.out.print ("NO");
            }
        }
    }
}

```

Input:  
1234  
Output:  
YES

---

Week-5:

```

1) import java.util.*;
class Bank {
    private int accno;
    private String name;
    private double bal;
    Bank (int accno, String name, double bal){
        this.accno = accno;
        this.name = name;
        this.bal = bal;
    }
    int getaccno(){
        return accno;
    }
    String getname(){
        return name;
    }
    double getbal(){
        return bal;
    }
    void setacco (int accno){
        this.accno = accno;
    }
    void setname (String name){
        this.name = name;
    }
    void setbal (double bal){
        this.bal = bal;
    }
    void deposit (double amt){
        if (amt >= 0){
            bal += amt;
        }
    }
}

```

Input:  
1  
1234  
Rahul  
5000  
2000  
3000  
Output:  
Account Number: 1234  
Customer Name: Rahul  
Final Balance : 4000.0



```

    void withdraw(double amt) {
        if(amt >= 0 & amp; amt <= bal) {
            bal -= amt;
        }
    }

    public static void main(String args[]) {
        Scanner sc = new Scanner(System.in);
        int n = sc.nextInt();
        sc.nextLine();
        for(int i=0; i<n; i++) {
            int accno = sc.nextInt();
            sc.nextLine();
            String name = sc.nextLine();
            double bal = sc.nextDouble();
            double deposit = sc.nextDouble();
            double withdraw = sc.nextDouble();
            Bank b = new Bank(accno, name, bal);
            b.deposit(deposit);
            b.withdraw(withdraw);
            System.out.println("Account Number: " + b.getaccno());
            System.out.println("Customer Name: " + b.getname());
            System.out.printf("Final Balance: %.1f", b.getbal());
        }
    }
}

```

e) import java.util.\*;

```

class Electricity {
    private int id;
    private String name;
    private double units;

    Electricity(int id, String name, double units) {
        this.id = id;
        this.name = name;
        this.units = units;
    }

    int getId() {
        return id;
    }

    String getname() {
        return name;
    }

    double getunits() {
        return units;
    }
}

```

Input:

1  
100  
Ravi Kumar

80

Output:

Customer ID : 100  
Customer Name : Ravi Kumar  
Final Bill : 400.0

```

        double Final (double units) {
            double amt = 0.0;
            if (units <= 100)
                amt = units * 5;
            else if (units > 100 && units <= 200)
                amt = 100 * 5 + (units - 100) * 7;
            else if (units > 200)
                amt = (100 * 5) + (100 * 7) + (units - 200) * 10;
            if (amt > 2000)
                amt = amt * 0.95;
            return amt;
        }

        void display() {
            System.out.println("Customer ID: " + id);
            System.out.println("Customer Name: " + name);
            System.out.printf("Final Bill: %.2f", Final(units));
        }
    }

    public static void main (String args[])
    {
        Scanner sc = new Scanner (System.in);
        int n = sc.nextInt();
        sc.nextLine();
        for (int i = 0; i < n; i++) {
            int id = sc.nextInt();
            sc.nextLine();
            String name = sc.nextLine();
            double units = sc.nextDouble();
            Electricity e = new Electricity (id, name, units);
            e.display();
        }
    }
}

```

3) import java.util.Scanner;

```

class Booking {
    private int id;
    private String name;
    private double distance;
    private double fare;
    public Booking (int id, String name, double distance) {
        this.bookingid = id;
        this.name = name;
        this.distance = distance;
        calculateFare();
    }
}

```

```

public int getId(){
    return id;
}

public String getName(){
    return name;
}

public double getDistance(){
    return distance;
}

public double getFare(){
    return fare();
}

private void calculateFare(){
    fare = 50 + distance * 10;
    if(distance > 20){
        fare = fare * 0.90;
    }
}

class CityApp{
    public static void main(String[] args){
        Scanner sc = new Scanner(System.in);
        int n = Integer.parseInt(sc.nextLine());
        for(int i=0; i<n; i++){
            int id = Integer.parseInt(sc.nextLine());
            String name = sc.nextLine();
            double distance = Double.parseDouble(sc.nextLine());
            Booking booking = new Booking(id, name, distance);
            System.out.println("Booking ID: " + booking.getId());
            System.out.println("Customer Name: " + booking.getName());
            System.out.printf("Final Fare: %.2f\n", booking.getFare());
        }
    }
}

```

4) import java.util.\*;

```

class Student{
    private int id;
    private String name;
    private int sub;
    Student(int id, String name, int sub)
    {
        this.id=id;
        this.name=name;
        this.sub=sub;
    }
}

```



```

int getid(){
    return id;
}

String getname(){
    return name;
}

int getsub(){
    return sub;
}

double calculate()
{
    double fee = 1000 + (sub*800);
    if(sub>5){
        fee = fee*0.8;
    }
    return fee;
}

void display(){
    System.out.println("Enrollment ID : "+id);
    System.out.println("Student Name : "+name);
    System.out.printf("Final fee : %.2f\n", calculate());
}

public static void main(String args[]){
    Scanner sc = new Scanner(System.in);
    int n = sc.nextInt();
    sc.nextLine();
    for(int i=0; i<n; i++){
        int id = sc.nextInt();
        sc.nextLine();
        String name = sc.nextLine();
        int sub = sc.nextInt();
        Student s = new Student(id, name, sub);
        s.display();
    }
}

```

Input: 1  
1234  
Ravi Kumar

Output:  
Enrollment ID: 1234  
Student Name: Ravi Kumar  
Final Fee: 3400.0



## Week - 6

1) class PremiumSubscription {  
 double base;  
 double service;  
 double cost;  
 PremiumSubscription (double b, double s, double c){  
 base = b;  
 service = s;  
 Cost = c;  
 }

Input:  
 10.0  
 2.5  
 5.0  
 $b = 10.00$   
 $s = 2.50$   
 $c = 5.00$

}  
 double calculateMonthlyCost(){  
 return base+service+cost;  
 }

Output:

Rs. 17.50

2) class Product {  
 public double price;  
 Product (double price){  
 this. price = price;  
 }

Input:  
 50.00  
 0.20

class DiscountedProduct extends Product{  
 DiscountedProduct (double price, double rate){  
 Super(price);  
 this. rate = rate;  
 }  
 private double rate;  
 double calculateSellingPrice(){  
 return price\*(1-rate);  
 }

Output:

Rs. 40.00

3) class SalesTaxCalculator{  
 static int calculateFinalPrice (int price, int tax){  
 return price + ((price \* tax)/100);  
 }

static double calculateFinalPrice (double price, double tax){  
 return price + ((price \* tax)/100);  
}

Input:  
 100  
 10  
 100.0  
 5.0  
Output:  
 110  
 105.00

```

1) class Cuboid {
    double length, width, height;
    Cuboid(double l, double w, double h) {
        length = l;
        width = w;
        height = h;
    }
    double calculateVolume() {
        return length * height * width;
    }
}

class Cube extends Cuboid {
    Cube(double s) {
        super(s, s, s);
    }
    public double calculateVolume() {
        return Math.pow(length, 3);
    }
}

```

---

5) class Item {

```

protected String name;
protected double price;
public Item (String name, double price) {
    this.name = name;
    this.price = price;
}
public double calculateCost() {
    return price;
}

```

class Produce extends Item {

```

public Produce (String name, double price) {
    super(name, price);
}
@Override
public double calculateCost() {
    return price;
}

```

Input:

0.11	Input
0.20	0.01
0.2	0.1
0.051	0.051
0.2	0.2

Output:

1.99	Regular Banana
------	----------------

```

class OrganicProduce extends Produce {
    public OrganicProduce (String name, double price) {
        super (name, price);
    }
    @Override
    public double calculateCost() {
        return price * 0.90;
    }
}

```

12/10/25 Week -7

- 1) interface CostCalculator {
 void getEnergyDetails (Scanner scanner);
 void calculateAndDisplayCost();
 }
 class EnergyConsumptionTracker implements CostCalculator {
 double ratePerUnit;
 int numDays;
 double[] dailyConsumption;
 EnergyConsumptionTracker (double ratePerUnit, int numDays) {
 this .ratePerUnit = ratePerUnit;
 this .numDays = numDays;
 this .dailyConsumption = new Double [numDays];
 }
 public void getEnergyDetails (Scanner scanner) {
 for (int i=0; i<numDays; i++) {
 dailyConsumption [i] = scanner.nextDouble();
 }
 }
 public void calculateAndDisplayCost() {
 System.out.println ("Day-wise Energy Cost:");
 double totalCost = 0.0;
 for (int i=0; i<numDays; i++) {
 double dayCost = dailyConsumption [i] \* ratePerUnit;
 totalCost += dayCost;
 }
 System.out.printf ("Day %d: Rs %.2f\n", i+1, dayCost);
 }
 System.out.printf ("Total energy cost: Rs %.2f\n", totalCost);
 }



Day-wise Energy Cost:  
 Day 1: Rs. 0.10  
 Day 2: Rs. 0.20  
 Day 3: Rs. 0.30  
 Total Energy Cost: Rs. 0.60

Input:

0.01

3

10.0 20.0 30.0

2) interface Health Calculator {  
 double calculate BMI (double weight, double height);  
 }

```

class BMI Calculator implements HealthCalculator {
  public double calculate BMI (double weight, double height) {
    if (weight <= 0 || height <= 0) {
      return -1;
    }
    return weight / (height * height);
  }
}
    
```

Input:

70.0

1.75

Output:

BMI: 22.86

3) interface Interest Calculator {  
 double simpleInterest (double principal, double rate,  
 int time);  
 }

```

class SimpleInterestCalculator implements InterestCalculator {
  public double simpleInterest (double principal,
    double rate, int time) {
    return (principal * rate * time) / 100;
  }
}
    
```

Input:

1000.00

5.00

2

Output:

Simple Interest: 100.0

```

4) interface Inventory {
    void addProduct (String name, double price, int quantity);
    double calculateTotalValue();
}

class Product {
    private String name;
    private double price;
    private int quantity;
    public Product (String name, double price, int quantity) {
        this.name = name;
        this.price = price;
        this.quantity = quantity;
    }
    public double getValue() {
        return price * quantity;
    }
}

class SimpleInventory implements Inventory {
    private Product[] products;
    private int count;
    public SimpleInventory (int capacity) {
        products = new Product [capacity];
        count = 0;
    }
    public void addProduct (String name, double price,
                           int quantity) {
        if (count < products.length) {
            products [count++] = new Product (name, price,
                                              quantity);
            System.out.println ("Product added to inventory.");
        }
    }
}

```

```

public double calculateTotalValue() {
    double total = 0.0;
    for (int i=0; i<count; i++) {
        total += products [i].getValue();
    }
    return total;
}

```

Input: 1  
 Laptop  
 800.0  
 3  
 2  
 5  
 3

Output:  
 Product added to inventory  
 Total inventory value: \$2400.0  
 Invalid choice. Please  
 select a valid choice  
 (1/2/3).

5) interface AgeCalculator{  
 int calculateAge (int birthYear);  
}  
class HumanAgeCalculator implements AgeCalculator{  
private static final int CURRENT\_YEAR = 2024;  
public int calculateAge (int birthYear){  
return CURRENT\_YEAR - birthYear;  
}  
}  
Input: 1934  
Output: You are 90 years old.

Holds Week - 8:

1) import java.util.\*;  
class DotException extends Exception{  
public DotException (String message){  
super(message);  
}  
}  
class AtTheRateException extends Exception{  
public DotAtTheRateException (String message){  
super(message);  
}  
}  
class DomainException extends Exception{  
public DomainException (String message){  
super(message);  
}  
}  
public class Main {  
public static void main (String args[]){  
Scanner sc = new Scanner (System.in);  
String email = sc.nextLine().trim();  
try {  
validateEmail (email);  
System.out.println ("Valid email address");  
}  
}



```

        catch (DotException e){
            System.out.println ("DotException : " + e.getMessage ());
            System.out.println ("Invalid email address");
        }

        catch (AtTheRateException e){
            System.out.println ("AtTheRateException : " + e.getMessage ());
            System.out.println ("Invalid email address");
        }

        catch (DomainException e){
            System.out.println ("DomainException : " + e.getMessage ());
            System.out.println ("Invalid email address");
        }
    }

    public static void validateEmail (String email) throws
        DotException, AtTheRateException, DomainException {
        int atCount = email.length () - email.replace ("@", "").length ()
        if (atCount != 1 || email.startsWith ("@") || email.endsWith ("@"))
            || email.contains ("@@"))
                throw new AtTheRateException ("Invalid @ usage");

        if (email.endsWith (".") || email.startsWith (".") || email.contains (".."))
            throw new DotException ("Invalid Dot usage");

        int atIndex = email.indexOf ("@");
        String afterAt = email.substring (atIndex+1);
        if (! afterAt.contains (".")) {
            throw new DotException ("Invalid Dot usage");
        }

        String domain = email.substring (email.lastIndexOf (".")+1);
        List<String> validDomains = Arrays.asList ("in", "com", "net", "biz");
        if (! validDomains.contains (domain))
            throw new DomainException ("Invalid domain");
    }
}

Input: sample@gmail.com
Output: Valid email address

```

```
2) import java.util.*;  
class InvalidDurationException extends Exception{  
    InvalidDurationException (String msg){  
        super(msg);  
    }  
}  
public class Main{  
    public static void main (String args[]){  
        Scanner sc = new Scanner (System.in);  
        int n = sc.nextInt();  
        try {  
            ValidateMeetingDuration (n);  
            System.out.println ("Meeting scheduled successfully");  
        } catch (InvalidDurationException e){  
            System.out.println ("Error: " + e.getMessage());  
        }  
    }  
    static void validateMeetingDuration (int n) throws  
    InvalidDurationException {  
        if (n <= 0 || n > 240){  
            throw new InvalidDurationException ("Invalid meeting duration");  
        }  
    }  
}
```

Input:      Output:  
120            Meeting scheduled successfully

```
3) public class Main{  
    public static void main (String args[]){  
        Scanner sc = new Scanner (System.in);  
        String username = sc.nextLine();  
        try {  
            ValidateUsername (username);  
            System.out.println ("username is valid: " +  
                username);  
        } catch (InvalidUsernameException e){  
            System.out.println ("Invalid username: " +  
                e.getMessage());  
        }  
    }  
    static void validateUsername (String username) throws  
    InvalidUsernameException {  
        if (username.contains (" ")){  
            throw new InvalidUsernameException ("username cannot contain ");  
        }  
    }  
}
```



```
if(username.length() < 5)
    throws new InvalidUsernameException ("username
        must be atleast 5 characters");
```

Input:

John

Output:

Invalid username: username  
must be atleast 5 characters

```
4) public class Main{
    public static void main (String args[]){
        Scanner sc = new Scanner (System.in);
        int age = sc.nextInt();
        ValidateAge (age);
        System.out.println ("Eligible to vote");
    }
    catch (InvalidAgeException e){
        System.out.println ("Exception occurred:
            InvalidAgeException");
    }
    catch (InputMismatchException e){
        System.out.println ("An error occurred: " +
            e.getClass().getName());
    }
    catch (Exception e){
        System.out.println ("An error occurred: " +
            e.getMessage());
    }
}
static void ValidateAge (int age) throws Invalid
AgeException{
    if (age < 18){
        throw new InvalidAgeException ("Age is not
            valid to vote");
    }
}
```

Input:

Output:

```

public static void main (String args[])
{
    Scanner sc = new Scanner (System.in);
    String fileName = sc.nextLine();
}

try {
    validateFileName (fileName);
} catch (FileNotFoundException e) {
    System.out.println ("Error: " + e.getMessage ());
}

static void validateFileName (String filename)
throws FileNotFoundException {
    if (filename.length () < 3 || !filename.matches
        ("[A-Za-z0-9]+")) {
        throw new FileNotFoundException ("Invalid");
    }
}

Input: my file 123
Output: valid file name

```

Week - 9

- import java.util.\*;

```

class Main {
    public static void main (String args[]) {
        Scanner sc = new Scanner (System.in);
        int n = sc.nextInt();
        for (int i=0; i<n; i++) {
            int num = sc.nextInt();
            if (list.isEmpty() || num > list.size() - 1) {
                list.add (num);
            }
        }
        System.out.print (list);
    }
}

```

Input: 7  
3 5 9 1 11 7 13

Output: [3, 5, 9, 11, 7, 13]

```
2) import java.util.*;  
class main{  
    public static void main (String args[]){  
        Scanner sc = new Scanner (System.in);  
        int n = Integer.parseInt (sc.nextLine());  
        LinkedList<String> playlist = new LinkedList<>();  
        int currentIndex = 0;  
        for (int i=0; i<n; i++)  
            String command = sc.nextLine();  
            if (command.startsWith ("ADD")){  
                String song = command.split (" ")[1];  
                playlist.add (song);  
                if (playlist.size() == 1){  
                    currentIndex = 0;  
                }  
            }  
            else if (command.startsWith ("Remove")){  
                String song = command.split (" ")[1];  
                int removeIndex = playlist.indexOf (song);  
                if (removeIndex != -1){  
                    playlist.remove (removeIndex);  
                    if (playlist.isEmpty()) {  
                        currentIndex = 0;  
                    }  
                    else if (removeIndex < currentIndex){  
                        currentIndex--;  
                    }  
                    else if (currentIndex >= playlist.size()){  
                        currentIndex = 0;  
                    }  
                }  
            }  
            else if (command.equals ("SHOW")){  
                if (playlist.isEmpty()) {  
                    System.out.println ("EMPTY");  
                }  
                else {  
                    for (String s: playlist){  
                        System.out.print (s + " ");  
                    }  
                    System.out.println();  
                }  
            }  
            else if (command.equals ("NEXT")){  
                if (playlist.isEmpty()) {  
                    System.out.println ("EMPTY");  
                }  
            }  
    }  
}
```

System.out.println(playlist.get(CurrentIndex))

Input:

4  
SHOW

ADD track  
ADD track

NEXT

Output:

EMPTY

tracks

```
3) import java.util.*;  
class main{  
    public static void main (String args[]){  
        Scanner sc = new Scanner (System.in);  
        int n = Integer.parseInt (sc.nextLine());  
        ArrayList < String > names = new ArrayList <>();  
        for (int i=0; i<n; i++){  
            names.add (sc.nextLine());  
        }  
        String search = sc.nextLine();  
        int count = 0;  
        for (String name : names){  
            if (name.equals (search)){  
                count++;  
            }  
        }  
        System.out.print (count);  
    }  
}
```

Input:

3

Mitchell

Sofia

Lily

Cameron

Output: 0

## Week - 10

```
1) import java.util.*;  
class Vehicle{  
    String regNumber;  
    String ownerName;  
    String vehicleType;  
    public Vehicle (String regNumber, String ownerName,  
        String vehicleType){  
        this.regNumber = regNumber;  
        this.ownerName = ownerName;  
        this.vehicleType = vehicleType;  
    }  
    public boolean equals (Object obj){  
        if (this == obj), return true;  
        if (obj == null) || getClass () != obj.getClass () return false;  
        Vehicle v = (Vehicle) obj;  
        return regNumber.equals (v.regNumber);  
    }  
}
```



```

public int hashCode(){
    return regNumber.hashCode();
}

public String toString(){
    return regNumber + " " + ownerName + " " + vehicleType;
}

public class Main {
    public static void main (String args[]){
        Scanner sc = new Scanner (System.in);
        int n = sc.nextInt();
        sc.nextLine();
        HashSet <Vehicle> vehicleSet = new HashSet<>();
        for (int i=0; i<n; i++) {
            String regNumber = sc.next();
            String ownerName = sc.next();
            String vehicleType = sc.next();
            Vehicle v = new Vehicle (regNumber, ownerName, vehicleType);
            vehicleSet.add(v);
        }
        for (Vehicle v: vehicleSet){
            System.out.println(v);
        }
    }
}

Input: 4
WB05XY6789 Raj WB05XY6789 Raj
RJ06MN4567 Amit KLO7PQ1234 Seema
KLO7PQ1234 Seema RJ06MN4567 Amit
RJ06MN4567 Amit

```

2) import java.util.\*;

import java.text.DecimalFormat;

```

class Main {
    public static void main (String args[]){
        Scanner sc = new Scanner (System.in);
        HashMap <String, Double> fruitMap = new HashMap<>();
        DecimalFormat df = new DecimalFormat ("0.00");
        boolean invalidFormat = false;
        boolean invalidInput = false;
        while (true) {
            String input = sc.nextLine().trim();
            if (input.equalsIgnoreCase ("done")) break;
            if (!input.contains(":") || input.contains("-") ||
                input.contains("@")){
                invalidFormat = true;
                break;
            }
        }
    }
}

```



```

String[] parts = input.split(":");
if(parts.length != 2){
    invalidFormat = true;
    break;
}
String fruitName = parts[0].trim();
String quantityStr = parts[1].trim();
try{
    double quantity = Double.parseDouble(quantity);
    fruitMap.put(fruitName, quantity);
} catch(NumberFormatException e){
    invalidInput = true;
    break;
}
if(invalidFormat){
    System.out.println("Invalid Format");
}
else if(invalidInput){
    System.out.println("Invalid Input");
}
else{
    double total = 0.0;
    for(double qty : fruitMap.values()){
        total += qty;
    }
    System.out.println(df.format(total));
}
}

```

Input: Banana: 5  
Strawberry: 3  
done

Output: Invalid input.

```

3) import java.util.*;
class Main {
    public static void main(String[] args)
    {
        Scanner scan = new Scanner(System.in);
        int n = scan.nextInt();
        scan.nextLine();
        String[] arr = new String[n];
        for(int i=0; i<n; i++)
        {
            arr[i] = scan.nextLine();
        }
    }
}

```

```

TreeMap<Character, Integer> map = new TreeMap<>();
for(int i=0; i<arr.length; i++)
{
    for(int j=0; j<arr[i].length(); j++)
    {
        if(arr[i].charAt(j) == ' ')
        {
            continue;
        }
        map.put(arr[i].charAt(j), map.getOrDefault(
            arr[i].charAt(j),
            0) + 1);
    }
    System.out.println("Character Frequency:");
    for(Map.Entry<Character, Integer> entry: map.entrySet())
    {
        System.out.println(entry.getKey() + ": " +
                           entry.getValue());
    }
}

```

Input:

abc ABC

Output:

Character Frequency:

A : 1

B : 1

C : 1

a : 1

b : 1

c : 1

4) import java.util.\*;

class Main {

public static void main (String[] args)

{ Scanner scan = new Scanner (System.in);

int n = scan.nextInt();

Treeset<Integer> s = new TreeSet<>();

for(int i=0; i<n; i++)

{ int a = scan.nextInt();

s.add(a);

int find = scan.nextInt();

if (s.contains(find)) {

System.out.println (find + " is present!");

} else {

System.out.println (find + " is not present!");

